a first value to a second value, and the first loop is arranged to maintain the relationship between the value of the second voltage with each of the first and second values of the reference voltage.

9. An apparatus comprising:

a first node to receive a first voltage having a first value;

a second node to provide a second voltage having a second value less than the first value;

a power switching unit coupled between the first and second nodes;

a comparator to provide information based on a comparison between the second value and a value of a reference voltage;

a control unit to provide digital control information based on the information provided by the comparator to control the power switching unit;

a digital energy monitor to calculate a value of energy consumption of at least a portion of the apparatus based on digital values derived from at least the first value and a value of the digital control information from the control unit; and

a decision logic to adjust the value of the reference voltage based on the value of the energy consumption.

10. The apparatus of claim **9**, wherein the decision logic is arranged to track a minimum energy point (MEP) of the at least a portion of the apparatus based on the value of the energy consumption.

11. The apparatus of claim **9**, wherein the power switching unit include transistors arranged in parallel between the first and second nodes.

12. The apparatus of claim **11**, wherein the control unit is arranged to provide digital information including bits, and each of the bits is provided to a gate of a respective transistor among the transistors.

13. The apparatus of claim **9**, wherein the digital energy monitor includes circuitry to perform math operations to calculate the value of the energy consumption.

14. The apparatus of claim **9**, wherein the decision logic is arranged to cause the value of the reference voltage to change from one value to another value based on a minimum energy point (MEP) associated with the value of the energy consumption.

15. The apparatus of claim **9**, wherein the decision logic is arranged to perform an operation to find a minimum energy point (MEP) based on the value of the energy consumption, and to change the value of the reference voltage one value to another value when the MEP is found.

16. The apparatus of claim **9**, further comprising a die, wherein the power switching unit, the comparator, the control unit, the digital energy monitor, and the decision logic are included in the die.

17. An apparatus comprising:

a processing unit; and

a low-drop out (LDO) voltage controller coupled to the processing core, the low-drop out voltage controller including:

a power switching unit to receive a first voltage and provide a second voltage having a value based on a value of the first voltage;

a first loop to provide digital control information to control a switching of the power switching unit in order to maintain a relationship between the value of the second voltage and a value of a reference voltage; and

a second loop coupled to the power switching unit and the first loop to calculate a value of energy consumption of at least a portion of the apparatus based at least on the digital control information.

18. The apparatus of claim **17**, further comprising a die, wherein the processing unit and the LDO voltage controller are included in the die.

19. The apparatus of claim **17**, further comprising a die, wherein the LDO voltage controller is included in the die, and the processing unit is located outside the die.

20. The apparatus of claim **17**, wherein the second loop is arranged to adjust the value of the reference voltage based on the value of the energy consumption.

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